

Odlewnia Świdnica (OSW) ...

**Grey Cast Iron and Nodular Cast Iron
for a Variety of Structural Elements**

For many years Odlewnia Świdnica Sp. z o.o. (OSW) a foundry located in Świdnica, Poland and Kalenborn have been successfully cooperating in the field of hard castings.



Housing for an air-conditioning unit



Frame of a CNC drilling machine

The Kalenborn Group holds a majority-controlling interest in the Polish company.

The main operational activities of OSW are in the production of castings to be used as structural elements.

■ **Gray Cast Iron**

Iron carbon alloys featuring a high carbon content (> 2%) which exists in the form of graphite lamellae.

■ **Nodular Cast Iron**

Iron carbon alloys characterized by a high carbon content (> 2%) in which metallurgical treatment results in ball shaped carbon.

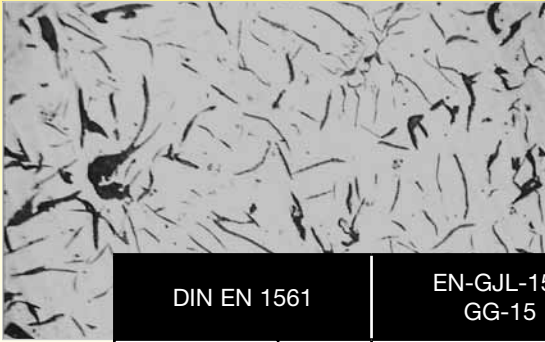
OSW supplies gray cast iron parts up to 6,000 kg and nodular cast iron elements up to 1,500 kg.

The company has capacities both for heat treatment and for finishing work. It operates a well equipped machine shop with the ability to process large items.

OSW supplies their products to a large clientele in Poland and other European countries.

If you have questions with respect to gray cast iron or nodular cast iron get in touch with OSW direct (also possible in English).

Gray Cast Iron



DIN EN 1561		EN-GJL-150 GG-15	EN-GJL-200 GG-20	EN-GJL-250 GG-25	EN-GJL-300 GG-30
Approx. %	C	3.5	3.3	3.0	3.0
	Si	2.5	2.2	2.0	1.8
	Mn	0.8	0.8	1.0	1.0
Hardness HB 30		160 - 190	180 - 220	190 - 230	200 - 240
Tensile strength		> 150 N/mm ²	> 200 N/mm ²	> 250 N/mm ²	> 300 N/mm ²
Workability		+++	+++	+++	+++
Wear resistance		--	--	--	--
Weldability		with restrictions			

Gray cast iron is an iron carbon alloy of high carbon content (> 2%) which exists in the form of graphite lamellae.

Fields of Application

Structural elements such as:

- machine frames
- pump housings
- motor casings
- fan housings

Advantages

Compared with welded structures, series production offers cost savings although pattern expenses and relative brittleness require due consideration.

Nodular Cast Iron



DIN EN 1563		EN-GJS-400-15 GGG-40	EN-GJS-500-7 GGG-50	EN-GJL-600-3 GGG-60
Approx. %	C	3.6	3.6	3.6
	Si	2.5	2.5	2.5
	Mn	< 0.25	< 0.4	< 0.4
Hardness HB		140 - 190	170 - 220	200 - 250
Tensile strength		> 400 N/mm ²	> 500 N/mm ²	> 600 N/mm ²
Elongation		15 %	7 %	3 %
Workability		+++	++	+++
Wear resistance		--	--	--
Weldability		with restrictions		

Nodular cast iron is an iron carbon alloy of high carbon content (> 2%). The difference to gray cast iron is that due to a metallurgical treatment the carbon takes a ball shape.

Fields of Application

- structural elements exposed to greater load
- replaces cast steel

Advantages

Compared with welded structures, series production offers cost savings. Although the material is less costly than cast steel it is more expensive than gray cast iron.

Casting Capacities at OSW

Melting furnaces Induction furnaces 2 x 2 t
 Cupola furnaces (gray cast iron) 2 x 5 t

Workpiece weights

Gray cast iron	100 ... 1,700 kg optimal	6,000 kg at a max.
Nodular cast iron	100 ... 1,000 kg optimal	1,500 kg at a max.
Hard casting	100 ... 1,600 kg optimal	3,300 kg at a max.

Casting tolerances CT-9 to CT-11 as defined in ISO 8062
 (mostly CT-10)

The above tolerances are applicable to as cast workpieces. For example, a workpiece with dimensions of 100 to 160 mm has a measuring tolerance of 3.6 mm for CT-10. This means ± 1.8 mm.

Heat Treatment

- stress relieving
- soft annealing prior to machining
- hardening after machining
- normalizing (e.g. of steel parts)

OSW has a furnace equipped with PC controlled temperatures for thermal treatment of workpieces. The kiln dimensions (length x width x height) are 5,200 x 3,600 x 2,000 mm. Temperatures up to 1,200 °C / 2,192 °F are feasible.



Machining facilities



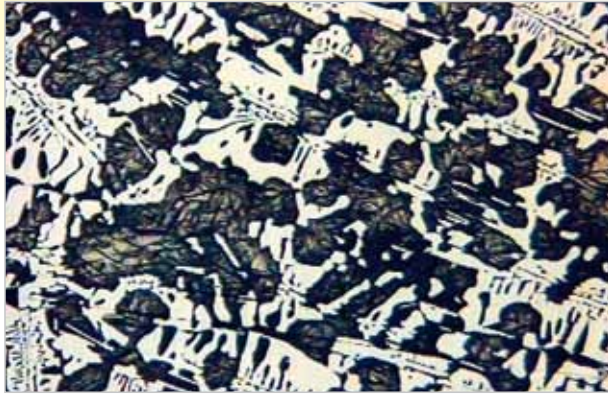
Heat treatment at 1,200 °C / 2,192 °F

Machining Options

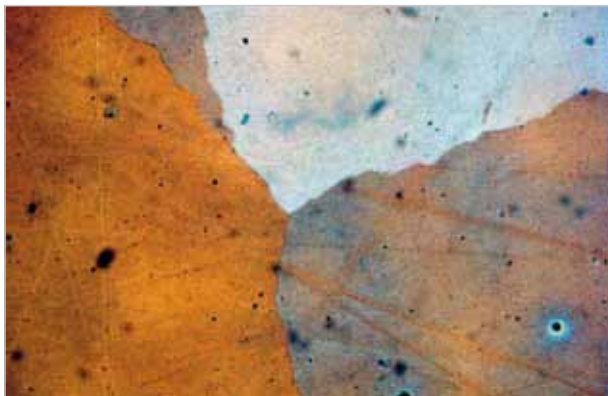
Machining equipment	Component dimensions	Component weight
Vertical lathe	Ø 3,500 mm	12 t max.
Universal lathe	max. Ø 1,000 mm Ø 650 mm up to l = 3,000 mm	
CNC center	l = 6,000 mm, w = 1,000 mm	5 t max.
Universal milling machine	1,000 x 400 mm	
Horizontal drilling and milling machine	2,800 x 2,800 x 1,000 mm	
Upright drilling machine	Ø 80 mm	5 t max.
Planing machine	6,000 x 1,800 x 1,400 mm (l, w, h)	
Slotting machine	Ø 2,000 mm, h = 450 mm	

The Kalenborn Casting Program:

**Hard Casting and Structural Casting
For a Wide Application Range**



NiHard 4 hard casting



KALMETALL-C manganese hard casting

**If you have questions
related to hard casting**

get in touch with Kalenborn.

**If you have questions
related to gray cast iron**

and nodular cast iron
contact Odlewnia Świdnica (OSW) direct
(also possible in English).

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Świdnica**
Sp.z o.o.



Hard Casting

High alloy, wear resistant cast iron with a high carbon content (> 2%) offered as

- KALMETALL-C hard casting characterized by a high portion of chromium carbides
- NiHard with a high nickel content

Used for structural elements subject to great wear (such as pipe bends) or as genuine wear parts.

Manganese Hard Casting

Another cast product is KALMETALL-C manganese hard casting. This is cast iron of low carbon content (< 2 %) but high manganese portion (carbon : manganese ratio = 1 : 10).

Manganese hard casting is known as an impact hardening material with the core remaining relatively tough.

The material offers particular advantages for hammers, scrapers, etc. when subject to impact load. The material is quite reasonably priced.

Due to the material's lower hardness, it is not recommended for parts that are exposed to wear without impact load.

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The Wear Protection People